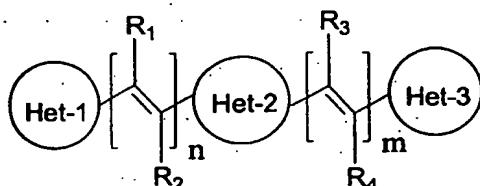


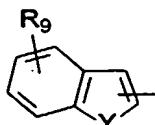
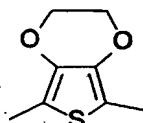
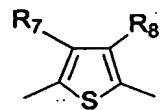
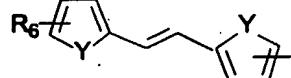
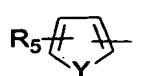
## CLAIMS

## 1. A compound of formula (I)



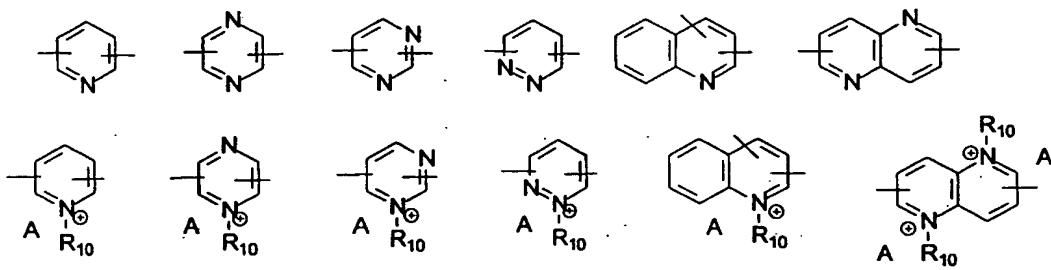
(I)

wherein Het-1 and Het-3 are identical or different, and are selected among the following heterocyclic groups:



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wherein Y may be O, S, or NZ with Z = H, lower alkyl, and aryl; and wherein R<sub>5</sub>, R<sub>6</sub>, R<sub>7</sub>, R<sub>8</sub>, and R<sub>9</sub> are the same or different, and are selected from the group consisting of H, alkyl groups having from 1 to 18 carbon atoms, alkoxy, aminoalkyl, 15 alkylhalide, hydroxyalkyl, alkyl groups containing hydroxy and amino functionalities, alkoxyalkyl, alkylsulfide, alkylthiol, alkylazide, alkylcarboxylic, alkylsulfonic, alkylisocyanate, alkylisothiocyanate, alkylalkene, alkylalkyne, aryl, formyl, and that can contain electronpoor ethenylic moieties such as maleimide, capable to react with nucleophilic groups such as -SH, and groups such as 20 isothiocyanate capable to react with groups such as -NH<sub>2</sub>; and Het-2 is selected among the following heterocyclic groups:



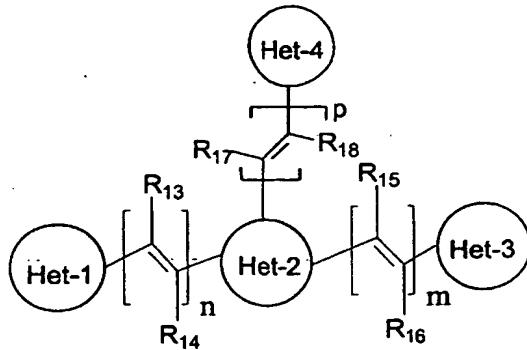
wherein R<sub>10</sub> is selected from the group consisting of H, alkyl groups having from 1 to 18 carbon atoms, alkoxy, aminoalkyl, alkylhalide, hydroxyalkyl, alkyl groups containing hydroxy and amino functionalities, alkoxyalkyl, alkylsulfide, alkylthiol, alkylazide, alkylcarboxylic, alkylsulfonic, alkylisocyanate, alkylisothiocyanate, alkylalkene, alkylalkyne, aryl, formyl, and that can contain electronpoor ethenylic moieties such as maleimide, capable to react with nucleophilic groups such as -SH, and groups such as isothiocyanate capable to react with groups such as -NH<sub>2</sub>;

5 and A is selected among the anions alkylsulfonate, arylsulfonate, polyarenesulfonate, triflate, halide, sulfate, methosulfate, phosphate, polyphosphate;

10 and wherein n and m, the same or different may be 0,1,2;

and R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, and R<sub>4</sub>, the same or different, may be H, lower alkyl, alkoxyalkyl, 15 aryl, cyano, alkoxy carbonyl, -(CR<sub>11</sub>R<sub>12</sub>)<sub>p</sub>-Het, wherein 0<p<10, R<sub>11</sub> and R<sub>12</sub>, the same or different, are selected from the group of H, lower alkyl, and Het may be Het-1 or Het-2 or Het-3.

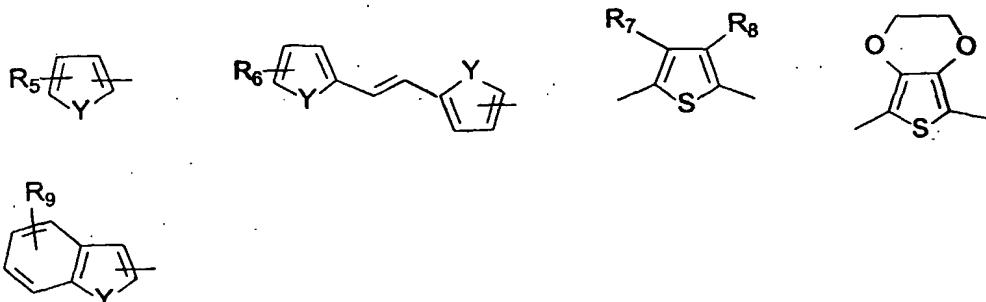
## 2. A compound of formula (II)



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(II)

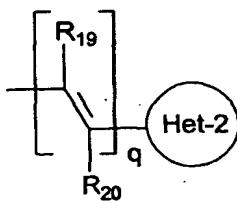
wherein Het-1, Het-3, and Het-4 are the same or different and are selected among the following heterocyclic groups:



wherein Y may be O, S, and NZ with Z = H, lower alkyl, aryl;

5 and R<sub>5</sub>, and R<sub>6</sub>, are the same or different, and are selected from the group consisting of H, alkyl groups having from 1 to 18 carbon atoms, alkoxy, aminoalkyl, alkylhalide, hydroxyalkyl, alkyl groups containing hydroxy and amino functionalities, alkoxyalkyl, alkylsulfide, alkylthiol, alkylazide, alkylcarboxylic, alkylsulfonic, alkylisocyanate, alkylisothiocyanate, alkylalkene, alkylalkyne, aryl, formyl, ketone, and that can contain electronpoor ethenylic moieties such as maleimide, capable to react with nucleophilic groups such as -SH, and groups such as isothiocyanate capable to react with groups such as -NH<sub>2</sub>; R<sub>5</sub>, and R<sub>6</sub>, the same or different, may further be the following heterocyclic group:

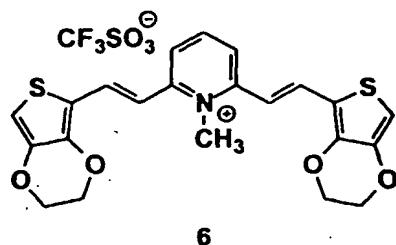
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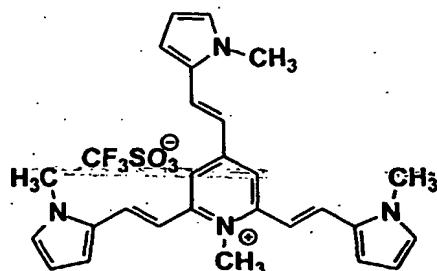
15 and R<sub>7</sub>, R<sub>8</sub>, and R<sub>9</sub> are defined as in claim 1;  
 and Het-2 is defined as in claim 1;  
 and wherein n, m, p, and q, the same or different, may be 0, 1, or 2;  
 and wherein R<sub>13</sub>, R<sub>14</sub>, R<sub>15</sub>, R<sub>16</sub>, R<sub>17</sub>, R<sub>18</sub>, R<sub>19</sub>, and R<sub>20</sub> are the same or different and are selected from the group of H, lower alkyl, alkoxyalkyl, aryl, cyano, alkoxy carbonyl, -(CR<sub>21</sub>R<sub>22</sub>)-Het, wherein 0<1<10, and R<sub>21</sub> e R<sub>22</sub>, the same or different, are selected from the group of H, lower alkyl, and Het may be Het-1 or Het-2 or Het-3, or Het-4.

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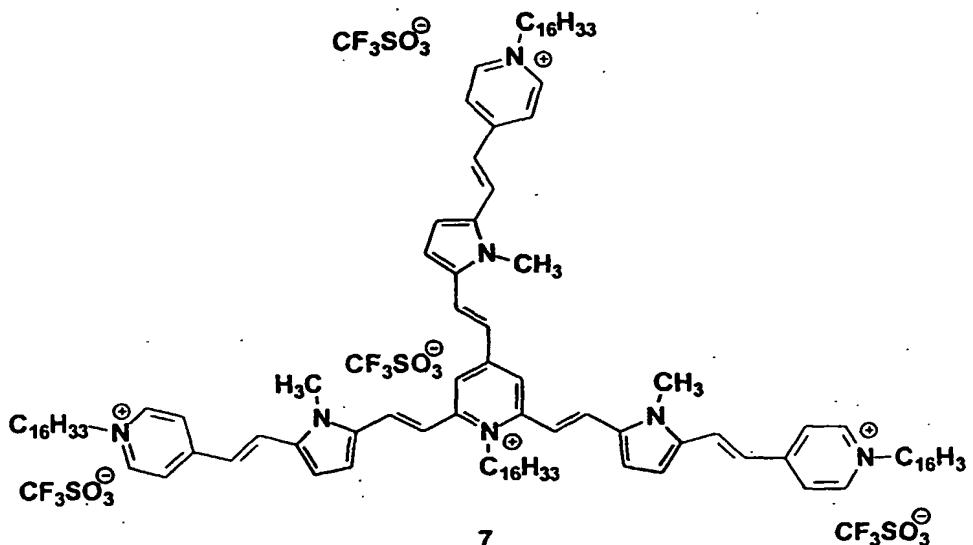
3. A compound according to claim 1, having the following formula (6)



4. A compound according to claim 2, having the following formula (3)



5. A compound according to claim 2, having the following formula (7)



10 6. Two-photon absorbing chromophore, in solution or in a solid state, characterized in that it is a compound of any of claim 1 to 5.

7. Compounds of general formula (I) according to claim 1 or (II) according to claim 2 for use in two-photon absorption systems.
8. Compounds of general formula (I) according to claim 1 or (II) according to claim 2 for use as optical power limiting agent via two-photon absorption.
- 5 9. Compounds of general formula (I) according to claim 1 or (II) according to claim 2 for use as imaging agents with two-photon absorbing activity for application in detection technologies such as two-photon laser scanning fluorescence microscopy.
10. A composition for use in two-photon absorption systems comprising a compound according to one of said claims 7, 8, 9.
11. A composition according to claim 10 characterized by the fact of comprising a polymer material chosen among poly(acrylate), poly(methacrylate), polyimide, polyamic acid, polystyrene, polycarbonate, polyurethane.
12. A composition according to claim 10 characterized by the fact of comprising an organically-modified silica ( $\text{SiO}_2$ ) network.
- 15 13. A composition according to claim 10 and 11, characterized by the fact that the said compound is linked to the polymer materials by covalent bonds.
14. A composition according to claim 10 and 12, characterized by the fact that the said compound is linked to the silica network by covalent bonds.
- 20 15. A composition according to claim 10 for use as optical power limiting agent via two-photon absorption.
16. A composition according to claim 10 for use as imaging agent with two-photon absorbing activity for application in detection technologies such as two-photon laser scanning fluorescence microscopy.